UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

100267

SUBJECT: Standard Chlorine: FS

DATE: 4-14-93

Recd 4/23/93

FROM: Robert S. Davis, RSD Coordinator (3HW13)
Biological Technical Assistance Group

TO: Katherine Lose, RPM (3HW42)

The BTAG has reviewed the subject document and offers the following comments for your use, on behalf of NOAA, FWS, and EPA BTAG members.

The remedial goals for ground water and surface water may provide protection for ecological resources, although uncertainty exists because of the limited toxicity database for chlorobenzenes.

Soils/sediment response levels were chosen to represent a contaminant concentration above which remedial action may be required. The risk-based response level for on-site surface soils was 625 mg/kg of total chlorinated benzenes (TCBs). The Lowest Observed Effects Level (LOEL) for soil flora, 33 mg/kg, was used as a response level for ecological receptors in off-site soils and sediments. This LOEL was calculated from the results of lettuce seed toxicity tests conducted during the RI. The response level for off-site sediments is high compared to the Apparent Effects Threshold (AET) concentrations for 1.2.4-trichlorobenzene, which range from 0.031 to 0.064 mg/kg. In light of this, we suggest long-term monitoring of soils and sediments both for contaminant levels as well as biological responses. We further suggest that the PRP and his investigation develop a biology-based plan for this monitoring that includes both flora and fauna. In the past, we suggested that black birds be used. With regard to plants, we would be pleased to participate in developing a plan.

The remedial action objectives would be met to varying degrees by Alternatives 3, 4, and 5. However, the remedial action objectives may not be protective of aquatic resources because the response level (33 mg/kg TCBs) used for sediment remediation is high compared to the AET concentration for 1.2.4-trichlorobenzene.

Although site-specific sediment toxicity tests were conducted to help in determining target cleanup concentrations for the protection of aquatic resources, there are some concerns about

the interpretation of these test results. An LC50 toxicity test was conducted during the remedial investigation using Hyalella azteca. The LC50 for TCBs was determined to be 446 mg/kg, and the lowest observed effects concentration (LOEC) was 136 mg/kg. To conduct the test, sediment from the site was mixed with clean control sediment to create a series of concentrations of total chlorinated benzenes representing a 100%, 50%, 25%, 12.5%, and 3.25% mixture, in addition to a control. Table 6-95 in the RI Report showed that the concentration of TCBs in the undiluted sediment sample (100%) was 543 mg/kg. This value contradicts the data summary table (Table 2-8), which shows that concentrations of TCBs in the sediment sample used for the LC50 test (SSC-20-B) were 469 mg/kg. In addition, the analytical results were not validated: a duplicate sediment sample from the same location (SSC-20) contained only 33 mg/kg of TCBs. Because of the uncertainty in the actual concentrations of contaminants in the sediment sample, the results of the LC50 test should also be considered uncertain. If sample SSC-20 more accurately reflects the analytical characteristics of the sediment at that location, the LOEC (observed in the 25% mixture) would be as low as 8.3 mg/kg.

In addition to the 50 test, Hyallela growth and survival bioassays were conducted. In these tests, percent survival was significantly different from the control in a sediment sample (SDT-6) containing only 1.7 mg/kg of TCBs. These results, along with the concerns mentioned above, suggest that the response level for sediments of 33 mg/kg may not be protective of aquatic resources.

The proposed remedial alternatives presented in the Feasibility Study should be considered primarily source control measures, because they do not include remediation of most of the sediments in Red Lion Creek. Red Lion Creek contains widespread areas of sediments that contain concentrations of TCBs that are above the AET concentrations. Sediments collected from the farthest downstream areas sampled - between Route 9 the tide gate - contained concentrations of 1.2.4-trichlorobenzene ranging from 0.38 to 9.0 mg/kg, approximately 10 to 300 times the lowest AET concentration. The concentration of TCBs above which remediation may be required was 33 mg/kg, 200 to 1,000 times greater than the AETs for various chlorinated benzene compounds. Data on TCB toxicity indicate that the response level of 33 mg/kg may not be protective of aquatic resources.

Delaware River resources are currently restricted from access to Red Lion Creek because of the tide gate. However, future plans may involve the construction of fish passage facilities, in which case the remedial alternatives proposed here may not protect these resources. Even if fish passage facilities are not constructed, aquatic resources downstream from the tide gate may be at risk from the presence of contaminated sediments (it is not known if they are contaminated; no analyses have been conducted), or from future transport of contaminated sediments downstream

during high flow conditions. Also the tide gate should not be viewed as a protective barrier to keep environmental resources from contaminated areas.

Extensive sampling has been conducted in Red Lion Creek immediately downstream from the Standard Chlorine site, and the extent of contamination has been well defined in that area. However, only limited sampling of sediments has been conducted between Route 9 and the tide gate, and no sampling has been conducted downstream from the tide gate. Further studies should be conducted to determine extent of contamination downstream of Route 9 including the tide gate in the Delaware River. The administrative division of this site and the adjacent one down stream notwithstanding, it is suggested that continued chemical and biological monitoring of the area down to the tide gate be instituted.

The data management approaches used by the investigator has resulted in a very cloudy picture. At this point, it is not certain that the cleanup target of 33 mg/kg for sediment will even marginally protect environmental resources. In the interest of continuing the project, we suggest that the grid approach to sampling used to this point be continued. Chemical/biological monitoring should be intensified during remedial design and continued as part of the long-term monitoring activities. The plan should include flora and fauna and supplemental sediment toxicity testing. Gaps in the ecological risk assessment still outstanding should be used as a point of departure in designing the long-term monitoring plan.

Thanks for the opportunity to comment, and if you have any questions contact Bob Davis on X3155. If you want to use these comments directly or edit them into the official letter, I will be glad to discuss any issues that are unclear and even concur on your letter if you wish. In any case, feedback from the RPM is important to the efforts of the BTAG, and I would like to hear from you regarding the usefulness of these comments.